

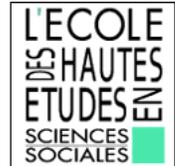


NORTHWESTERN INSTITUTE
ON COMPLEX SYSTEMS (NICO)

CHAMBERS HALL
600 FOSTER STREET
EVANSTON, IL 60208-4057
T . 847 491 2527
F . 847 556 1280



NORTHWESTERN
UNIVERSITY



**The Northwestern Institute on Complex Systems Lecture Series:
“Dynamics and Complexity in People and Societies”**

organized by NICO, NU and CAMS, EHESS
**Scientific Committee: Janet Pierrehumbert and Amie Wilkinson (NU),
Henri Berestycki and Jean-Pierre Nadal (EHESS)**

This Series is part of an event jointly organized by NU and EHESS,
sponsored by the James S. McDonnell Foundation, the French Ministry of Foreign Affairs, the Ecole des Hautes
Etudes en Sciences Sociales (EHESS), The Northwestern Institute on Complex Systems, The Northwestern
Mathematics Department, The French Interdisciplinary Group and The Weinberg College of Arts and Sciences.

Sharon Peperkamp
Associate Professor of Linguistics, University of Paris 8
Laboratoire de Sciences Cognitives et Psycholinguistique

Statistical Inferences and Linguistic Biases in Early Language Acquisition

Recent work has shown that for the purposes of language acquisition, infants can exploit statistical information that is present in the ambient language. Concentrating on phonology (a language's sound structure), I argue that acquisition is not purely statistical and that linguistic knowledge is exploited as well. Arguments will be drawn from both simulations of a statistical learning algorithm on phonetically transcribed speech and from artificial language learning experiments with infants.

Monday Oct 22 11:30 to 12:30, Chambers Hall, 600 Foster St.

Don Saari
UCI Distinguished Professor of Mathematics and Economics
Director, Institute for Mathematical Behavioral Sciences, UC Irvine

Complexity of Decisions and Multi-scale Analysis

It is election season, but will we elect whom the voters really want? A promising new approach in areas ranging from engineering to the physical and biological sciences is multi-scale analysis, but will the results accurately describe what is really happening? The mathematical complexity of rules, including decision and multi-scale analysis approaches, suggests that the answer for both questions is "Probably; no." In this expository talk, some of the difficulties are identified and explained.

Monday Oct 22 4:30 to 5:30, Tech L211

Marc Barthelemy
Department of Theoretical and Applied Physics
CEA, Bruyeres-le-Chatel, France

Modeling Epidemic Spread: Effect of Complexity and Scale

In this talk, I will first present a model for the spread of an infectious disease at a global scale. As I will show, the properties of the global airport network have some profound effects on the predictability of the epidemic spread. The model can also be tested against historical data such as the SARS and can serve as a useful tool in order to test different control strategies. In particular, it can be shown that travel restrictions are inefficient and I will present a method in order to mitigate a flu-like pandemic, as it could happen if the H5N1 virus becomes transmissible among humans. The success of the model at the global scale relies however on the existence of a dominant network determining the main channels of transmission. In a second part, I will thus discuss the case of smaller scales and I will show on the example of the flu in the US and in France that the situation is more complex and that there is not always such a dominant network. Although global epidemic forecast seems therefore to be a reachable goal, a serious modeling effort is needed in order to understand the spread of an epidemic in an environment as complex as an urban area.

Tuesday Oct 23 4:00 to 5:00, Swift 107

Steve Smale
Professor of Economics and Mathematics Emeritus, U. C. Berkeley
Professor Toyota Technological Institute at Chicago

Conditions for Consensus

Mathematics will be discussed towards providing understanding in language, economics, and zoology.

Wednesday Oct 24 4:30 to 5:30, Tech L211